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(54) **SYSTEM AND METHOD FOR COLLABORATION REVELATION AND PARTICIPANT STACKING IN A NETWORK ENVIRONMENT**

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CPC . ***H04N 7/142*** (2013.01); ***H04N 7/15*** (2013.01)

(58) **Field of Classification Search**
USPC 348/14.01, 14.07, 14.08
See application file for complete search history.

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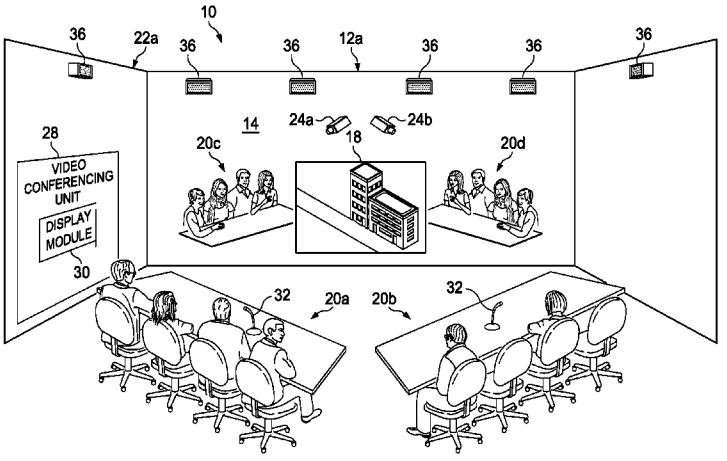
(57) **ABSTRACT**

A method is provided in one example embodiment and includes receiving video data associated with a meeting in a video conferencing environment; and displaying a plurality of images of participants of the meeting around a presenter or around collaboration material such that an overview of the participants is rendered on a display. The presenter or the collaboration material is rendered near a middle portion of the display. At least some of the participants are at one or more locations, which are remote from the display.

20 Claims, 8 Drawing Sheets



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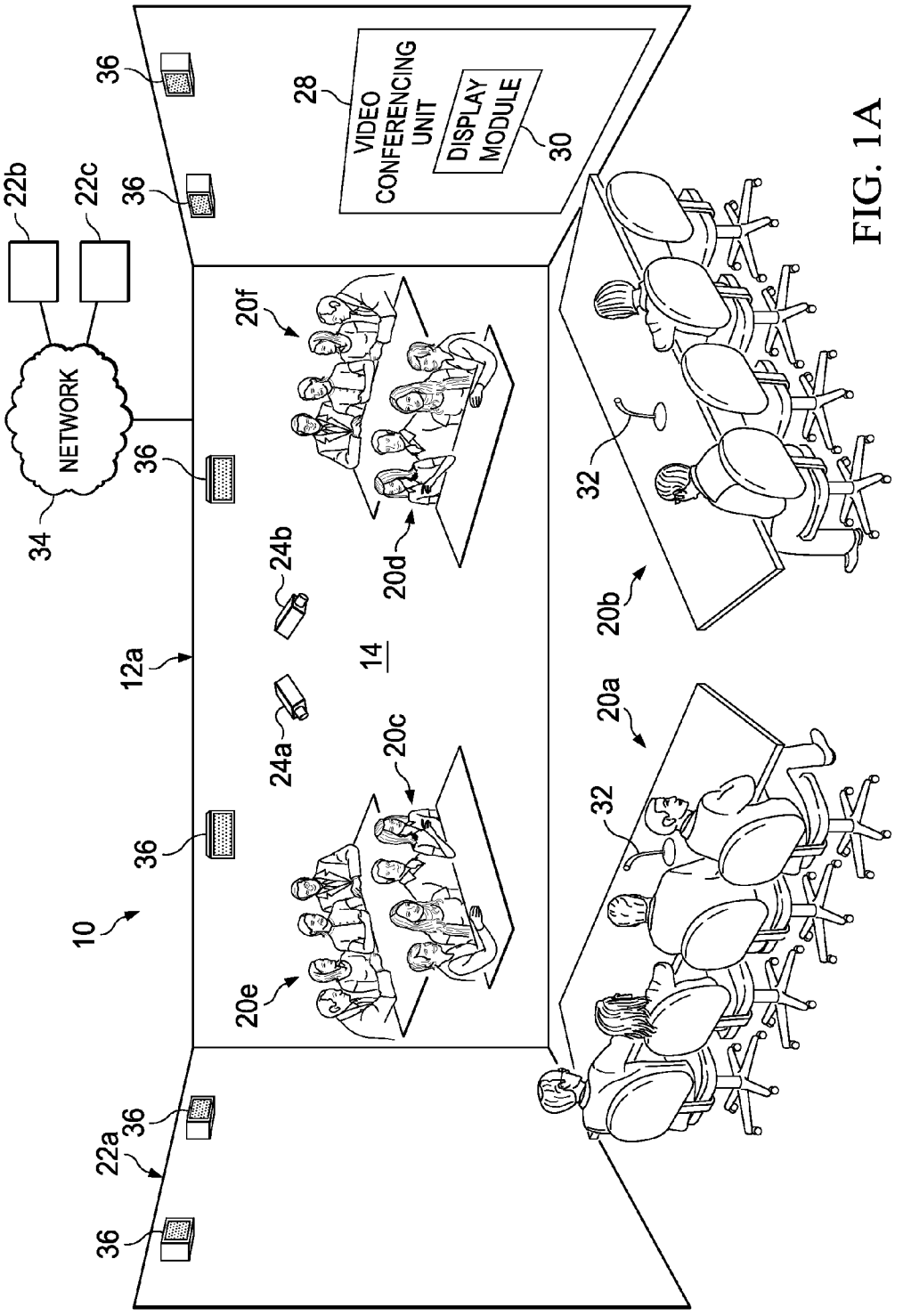
VIDEO CONFERENCING UNIT
DISPLAY MODULE
NETWORK
10
12a
14
20a
20b
20c
20d
20e
20f
22a
22b
22c
24a
24b
28
30
32
34
36

FIG. 1A

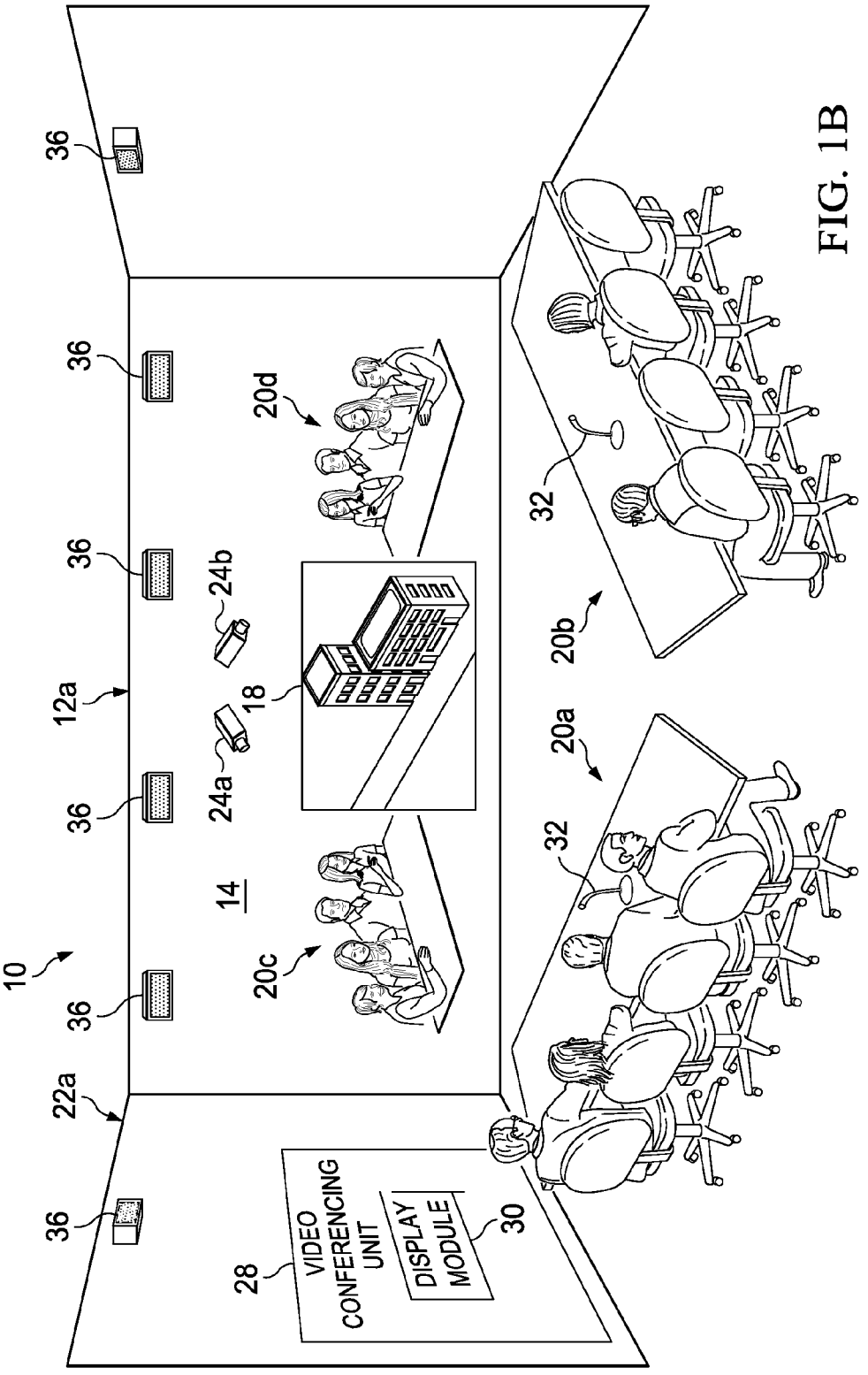
10
14
12a
22a
36
36
36
36
36
36
18
24a
24b
20a
20b
20c
20d
32
32
28
VIDEO CONFERENCING UNIT
DISPLAY MODULE
30

FIG. 1B

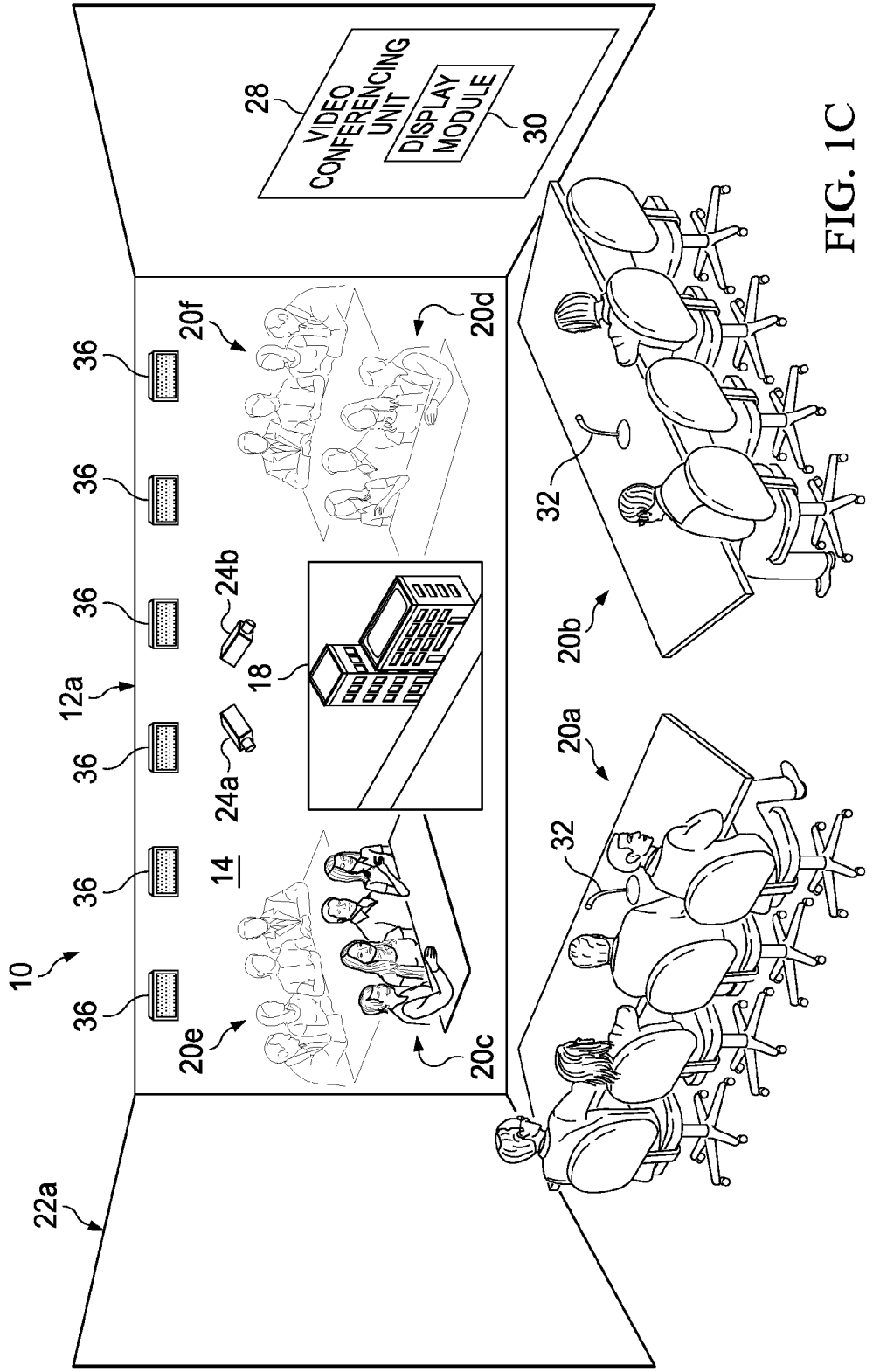
28
VIDEO CONFERENCING UNIT
DISPLAY MODULE
30
20f
20d
36
36
36
36
36
36
12a
24b
18
24a
14
10
20e
20c
32
20b
20a
32
22a

FIG. 1C

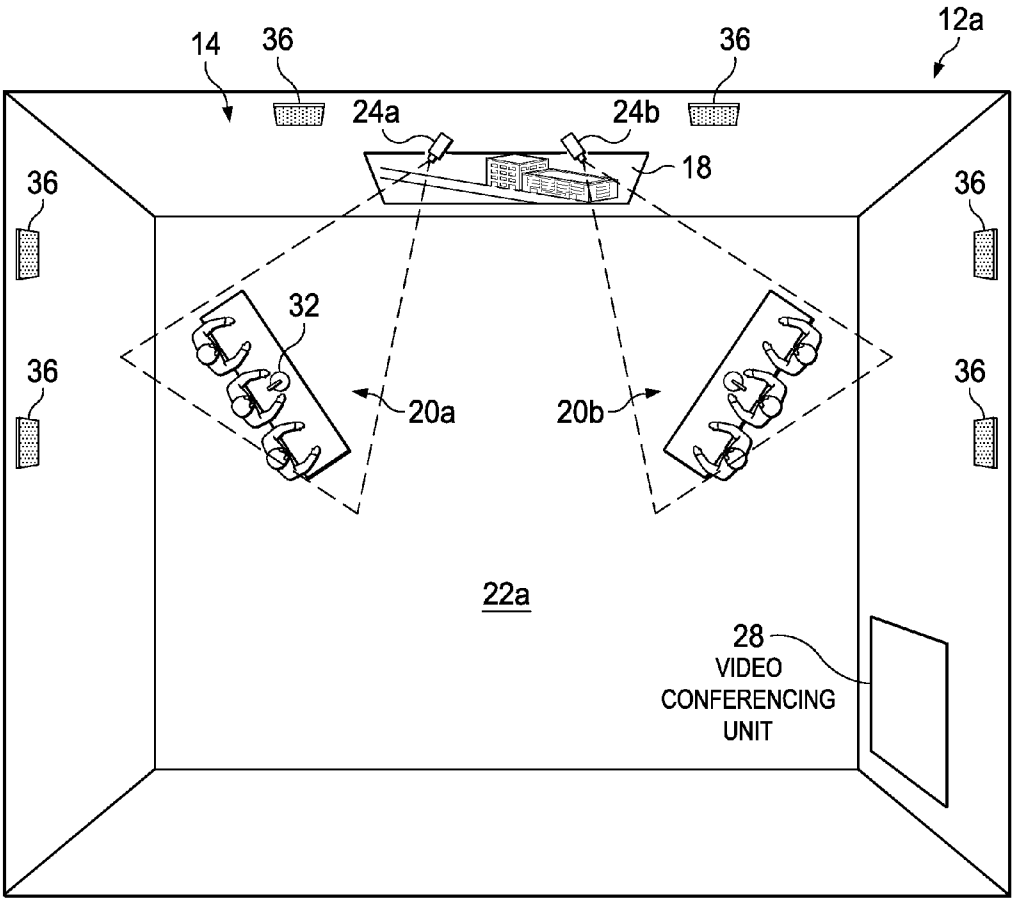
14
36
36
12a
24a
24b
18
36
36
36
36
32
20a
20b
22a
28
VIDEO
CONFERENCING
UNIT

FIG. 2A

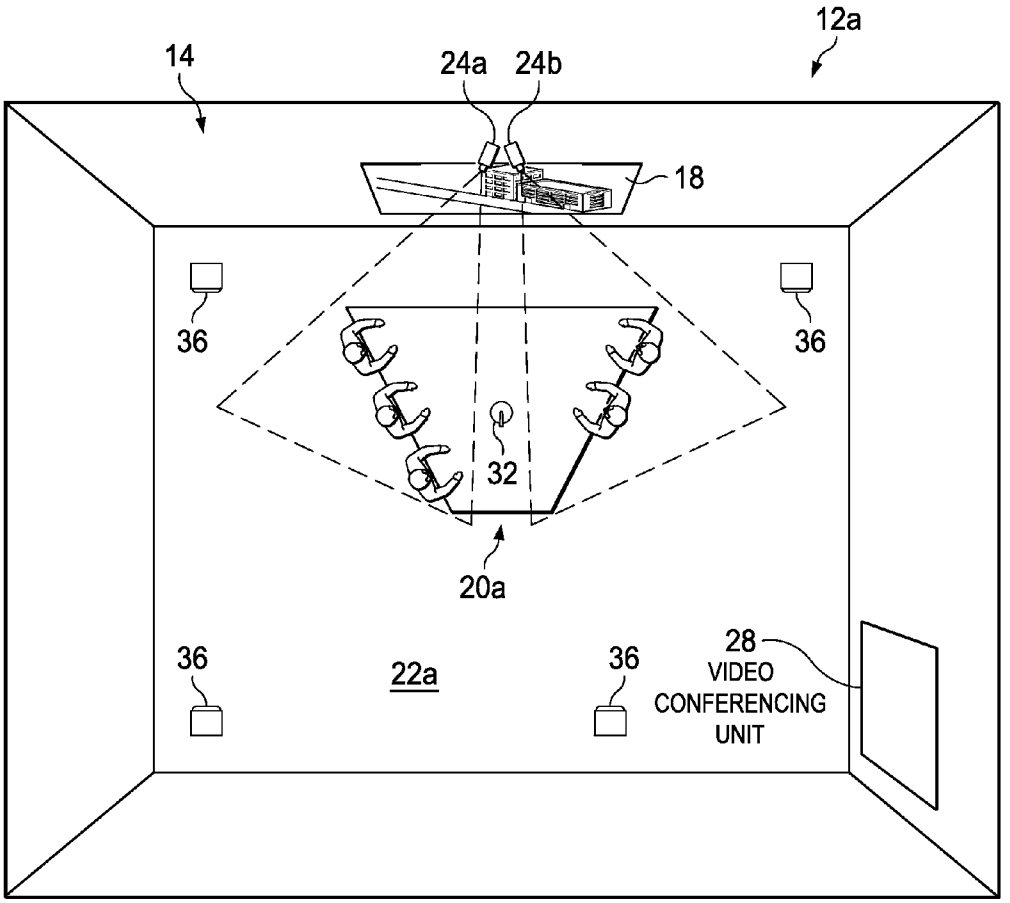
12a
14
24a
24b
18
36
36
32
20a
36
22a
36
28
VIDEO
CONFERENCING
UNIT

FIG. 2B

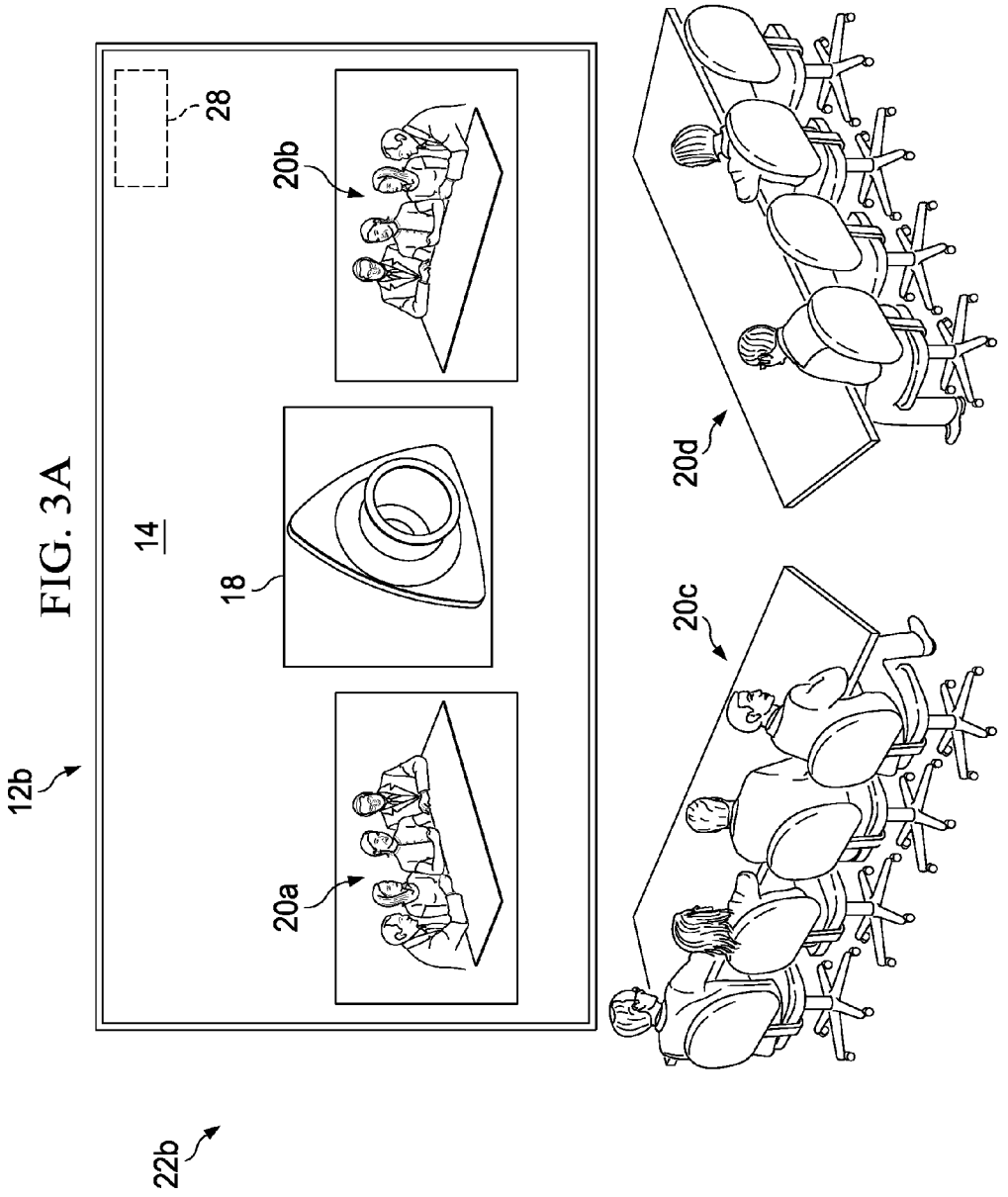

FIG. 3A

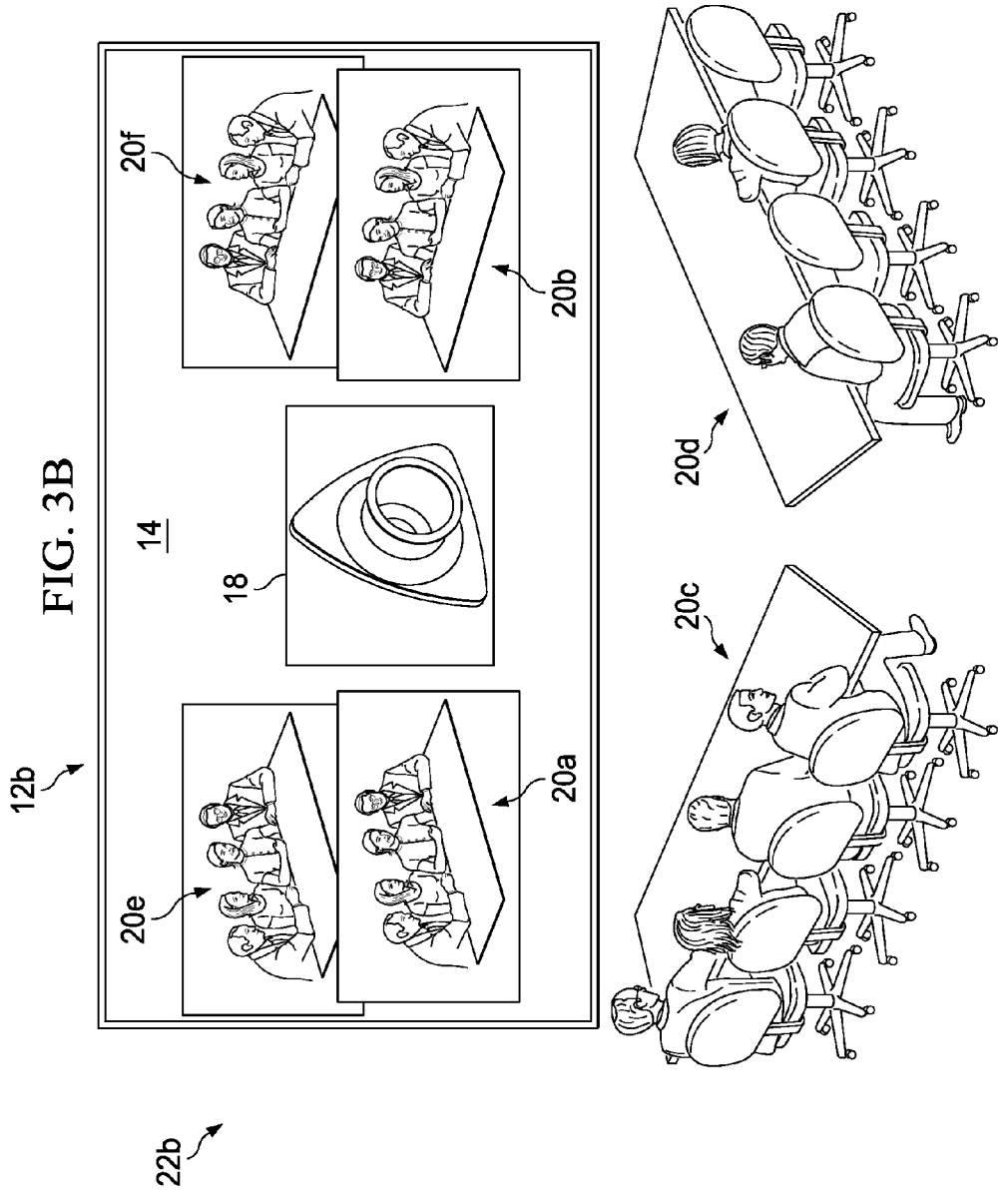

FIG. 3B

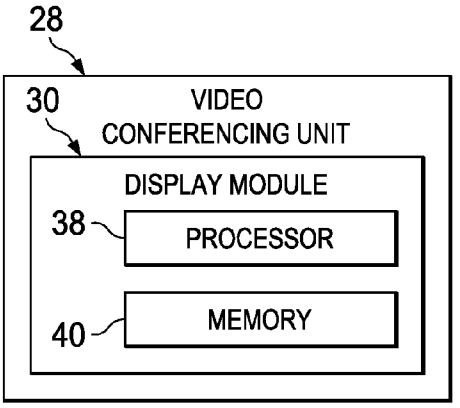
28
30
VIDEO CONFERENCING UNIT
DISPLAY MODULE
38
PROCESSOR
40
MEMORY

FIG. 4

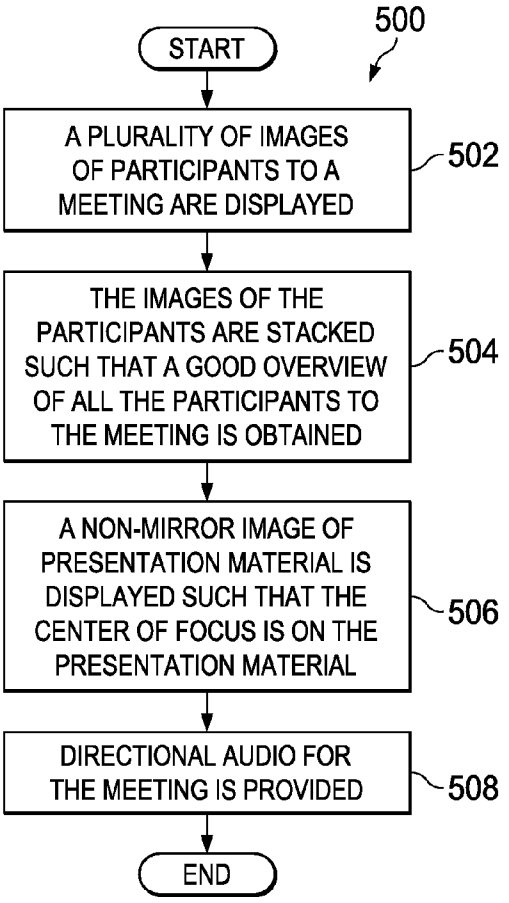
500
START
A PLURALITY OF IMAGES OF PARTICIPANTS TO A MEETING ARE DISPLAYED
502
THE IMAGES OF THE PARTICIPANTS ARE STACKED SUCH THAT A GOOD OVERVIEW OF ALL THE PARTICIPANTS TO THE MEETING IS OBTAINED
504
A NON-MIRROR IMAGE OF PRESENTATION MATERIAL IS DISPLAYED SUCH THAT THE CENTER OF FOCUS IS ON THE PRESENTATION MATERIAL
506
DIRECTIONAL AUDIO FOR THE MEETING IS PROVIDED
508
END

FIG. 5

SYSTEM AND METHOD FOR COLLABORATION REVELATION AND PARTICIPANT STACKING IN A NETWORK ENVIRONMENT

TECHNICAL FIELD

This disclosure relates in general to the field of communications and, more particularly, to collaboration revelation and participant stacking in a network environment.

BACKGROUND

Video services have become increasingly important in today's society. In certain architectures, service providers may seek to offer sophisticated video conferencing services for their participants. The video conferencing architecture can offer an "in-person" meeting experience over a network. Video conferencing architectures can deliver real-time, face-to-face interactions between people using advanced visual, audio, and collaboration technologies. The ability to optimize video communications provides a significant challenge to system designers, device manufacturers, and service providers alike.

BRIEF DESCRIPTION OF THE DRAWINGS

To provide a more complete understanding of the present disclosure and features and advantages thereof, reference is made to the following description, taken in conjunction with the accompanying figures, wherein like reference numerals represent like parts, in which:

FIG. **1**A is a simplified block diagram of a communication system for collaboration revelation and participant stacking in accordance with one example embodiment of the present disclosure;

FIG. **1**B is a simplified block diagram in accordance with another embodiment of the present disclosure;

FIG. **1**C is a simplified block diagram in accordance with another embodiment of the present disclosure;

FIG. **2**A is a simplified block diagram in accordance with another embodiment of the present disclosure;

FIG. **2**B is a simplified block diagram in accordance with another embodiment of the present disclosure;

FIG. **3**A is a simplified block diagram in accordance with another embodiment of the present disclosure;

FIG. **3**B is a simplified block diagram in accordance with another embodiment of the present disclosure;

FIG. **4** is a simplified block diagram in accordance with another embodiment of the present disclosure; and

FIG. **5** is a simplified flowchart illustrating potential operations associated with the present disclosure.

DETAILED DESCRIPTION OF EXAMPLE EMBODIMENTS

Overview

A method is provided in one example embodiment and includes receiving video data associated with a meeting in a video conferencing environment; and displaying a plurality of images of participants of the meeting around a presenter or around collaboration material such that an overview of the participants is rendered on a display. The presenter or the collaboration material is rendered near a middle portion of the display. At least some of the participants are at one or more locations, which are remote from the display.

In more detail implementations, the method can include stacking the plurality of images to create the overview of the participants of the meeting. In addition, a first image of a first one of the participants is partially behind a second image of a second one of the participants. The plurality of images can be blended and shaded to indicate an importance thereof or a distance from the display. The method can also include displaying a non-mirror image of the collaboration material on the display. The method can further include configuring the middle portion of the display in a seamless transition in order to accommodate the presenter or the collaboration material.

Directional audio can be provided for the meeting to assist the participants in perception capabilities associated with the meeting. In addition, shared content of the meeting can be accommodated during collaboration activities via a touch sensitive wall area. A presence of at least one of the participants in front of the display can be detected during the collaboration activities.

Example Embodiments

Turning to FIG. **1**A, FIG. **1**A is a simplified block diagram of a system **10** for providing a video session in a network environment in accordance with one embodiment of the present disclosure. System **10** includes a local conference room **22***a*, remote conference rooms **22***b* and **22***c*, and a network **34**. Local conference room includes a display screen **12***a*, participants **20***a* and **20***b*, cameras **24***a* and **24***b*, a video conferencing unit **28**, and one or more speakers **36**. Display screen **12***a* includes an image **14**. Image **14** includes participants **20***c-f*. Video conferencing unit **28** includes a display module **30**.

Video conferencing unit **28** is configured to display image **14**, and one or more participants (e.g., participants **20***c-f*) on display screen **12***a*. Participants **20***c-f* may each be at a different remote location, at the same remote location, or some at a different remote location and some at the same remote location. Further, each participant **20***a-f* could be a single participant or a plurality of participants. In one example, in addition to being an endpoint, video conferencing unit **28** may contain a multipoint control unit (MCU), or may be configured to communicate with a MCU.

System **10** can be configured to organize a multi-purpose screen space to optimize the feeling of presence, and to focus the attention of participants on collaboration material or a presenter, while keeping an overview over all meeting participants in a multi-site situation. In one particular instance, system **10** may be configured to stack video segments of participants from multiple sites. More specifically, some video segments can be above and/or partially behind other video segments. Blending, shading, and/or audio effects can be used to make one or more of the video segments partly visible, while indicating grade of importance and/or distance. The stacking can also make the meeting scalable from one local meeting to two or more sites while providing good eye contact for the participants. The participants can be stacked in such a way as to keep the focus of attention on collaboration material or a presenter, which are in the center of display image **14** and surrounded by images of the meeting attendees.

For purposes of illustrating certain example techniques of system **10**, the following foundational information may be viewed as a basis from which the present disclosure may be properly explained. Video conferencing allows two or more locations to interact via simultaneous two-way video and audio transmissions. The usability of systems for video conferencing and Telepresence needs to be able to serve multiple purposes such as connect separate locations by high quality

two-way video and audio links, share presentations and other graphic material (static graphics or film) with accompanying audio, provide a means for live collaboration between participants in the separate locations, etc.

In video conferencing systems, it is desirable to see the other party on a display screen. The representation of participants from a separate location, for instance sitting at a meeting room table, is done by filming with a camera, mirroring the image, and reproducing the image on a screen locally. The reproduced image is like looking through a transparent boundary into another room. The layout of the reproduction can quickly become a challenge, especially with multiple sites that contain many participants. Similar challenges can also apply to the accompanying multichannel audio. Adding presentation material and the desire for collaboration can further add to the challenge.

Collaboration can include various ways of human interaction. One way to simplify the concept of collaboration is to think of it as pointing to, drawing on, and/or annotating presentation material (e.g., chart, graph, white board, video, PowerPoint presentation, text document, etc.). For collaboration over video conferencing and Telepresence, virtually sharing the presentation material is essential. Sharing the presentation material can be done by using a video screen that can show the same content in both rooms and provide means for pointing and annotation, for instance by having touch functionality. Because the participants working close to or on the collaboration screen are often the center of focus in the interaction, a natural and/or intuitively understandable representation of the participants and presentation material can be especially important.

However, capturing participants by camera and microphone in itself can be challenging, as participants move around and frequently turn different directions. In addition, the camera will invariably capture some content and material on the screen that is already represented separately. Even if the capture could be done well, reproduction on remote end sites can end up confusing, as the reproduction is a mirror image, or it is difficult to determine where the center of focus should be.

Solutions using a separate video stream for presentation material tend to reduce the feeling of presence for remote participants. The remote participants are trapped between the mirrored representation of participants looking at each other through a virtual transparent boundary and a non-mirrored representation of content and collaboration material on which they are working. Certain problems in these contexts include how to capture and represent the participants sharing a collaboration surface in an intuitively understandable way, how to combine and represent the different elements (participants, collaborating people, content, collaboration material) together in one meaningful, comprehensive and dynamic fashion, and how to organize a multi-purpose screen space to optimize the feeling of presence, all while keeping an overview over meeting participants in a multi-site situation. Multisite call scenarios with the option of multiple video streams from each site can add complexity to the layout.

In accordance with one example implementation, system **10** can separate the different elements on a display in an intuitively understandable fashion. In one example implementation, video segments of participants from multiple sites may be stacked above and/or partially behind each other. Blending and shading can be used to make one or more of the video segments partly visible, while indicating grade of importance and/or distance. Switching can be used to change the position of the displayed participants dynamically according to activity or importance, or the order and layout can be fixed or controlled manually. Tuning or calibrating the details of the layout and dynamic layout control can provide a way of seamlessly transitioning between the switching and active presence paradigms. Changes can be made using smooth animations. The effect can create a good compromise between having the main and/or active sites Telepresence style large and positioned in front with good eye contact and yet still keep a good overview of all participants in the meeting, while preserving screen area to be used for presenters and/or collaboration material.

The layout of the scene can be made locally if video conferencing unit **28** is capable of receiving multiple streams and making its own layout. A multi-stream video layout that makes all participants and/or sites visible can provide a good overview of the situation for participants in a multi-point conference, where pure switching would make only a few participants visible and "active presence" may detract from naturalness. Directional audio can enhance the understanding of the scene and aid perception.

Turning to the example infrastructure associated with present disclosure, display screen **12***a* offers a screen on which video data can be rendered for the participants. Note that as used herein in this Specification, the term 'display' is meant to connote any element that is capable of delivering image data (inclusive of video information), text, sound, audiovisual data, etc. to participants. This would necessarily be inclusive of any panel, plasma element, television (which may be high-definition), monitor, computer interface, screen, projector, Telepresence devices (inclusive of Telepresence boards, panels, screens, surfaces, etc.), or any other suitable element that is capable of delivering/rendering/projecting such information.

Network **34** represents a series of points or nodes of interconnected communication paths for receiving and transmitting packets of information that propagate through system **10**. Network **34** offers a communicative interface between local conference room **22***a* and one or both remote conference rooms **22***b* and **22***c*, and may be any local area network (LAN), wireless local area network (WLAN), metropolitan area network (MAN), wide area network (WAN), VPN, Intranet, Extranet, or any other appropriate architecture or system that facilitates communications in a network environment.

Video conferencing unit **28** is a network element that can facilitate the video conferencing activities discussed herein. As used herein in this Specification, the term 'network element' is meant to encompass any of the aforementioned elements, as well as routers, switches, cable boxes, gateways, bridges, loadbalancers, firewalls, MCUs, inline service nodes, proxies, servers, processors, modules, or any other suitable device, component, element, proprietary appliance, or object operable to exchange information in a network environment. These network elements may include any suitable hardware, software, components, modules, interfaces, or objects that facilitate the operations thereof. This may be inclusive of appropriate algorithms and communication protocols that allow for the effective exchange of data or information.

In one implementation, video conferencing unit **28** includes software to achieve (or to foster) the video conferencing activities discussed herein. This could include the implementation of instances of display module **30**. Additionally, each of these elements can have an internal structure (e.g., a processor, a memory element, etc.) to facilitate some of the operations described herein. In other embodiments, these video conferencing activities may be executed externally to these elements, or included in some other network element to achieve the intended functionality. Alternatively,

video conferencing unit **28** may include software (or reciprocating software) that can coordinate with other network elements in order to achieve the video conferencing activities described herein. In still other embodiments, one or several devices may include any suitable algorithms, hardware, software, components, modules, interfaces, or objects that facilitate the operations thereof.

Turning to FIG. **1**B, FIG. **1**B is a block diagram illustrating additional details associated with system **10**. System **10** includes local conference room **22***a*. Local conference room includes display screen **12***a*, participants **20***a*, and **20***b*, and video conferencing unit **28**. In one illustrative example, the representation or location of participants **20***c* and **20***d* in image **14** may be adjusted to accommodate and keep the center of attention on presentation material **18**. More specifically, participants **20***c* and **20***d* may be moved from the center of image **14** to the sides of image **14** in order to make room for presentation material **18** in the middle of image **14** so all participants **20***a-d* can focus on presentation material **18**. Presentation material **18** is systematically non-mirrored and shown in the center of the display at each remote site so each participant **20***a-d* can view presentation material **18** as if they were all in the same room. With the presentation material in the middle of the display at all sites, it is evident for the local participants **20***a* and **20***b* that the far end participants **20***c* and **20***d* are also looking at the presentation, thereby creating a virtual center of attention. Shared content can also be handled during collaboration, by all sites. This could involve, for instance, a touch sensitive wall area and a system detecting the presence of a person in front of that area. The transitions in (and out of) the presentation, where the participant images are moved to the sides, could be seamlessly animated.

One way to trigger the animation can be if someone simply steps close to the center part of the wall and a collaboration surface is produced (e.g., similar to a whiteboard) allowing for collaboration. The actual video of people (i.e., participants) can involve single streams of video from multiple sites, or multiple streams from a single site, or any suitable combination thereof. The arrangement of the different video streams (to the sides of the display) can be dependent on the room layouts and/or call scenario.

For example, one particular layout could involve a point-to-point scenario with dual video streams plus content. Tables can be optimized for the appropriate setting. The stage would be set for content. Cameras centered on top of the content area can be targeting the tables in the room. Participants looking at the content would, therefore, also be represented on the remote site with a strong probability for good eye contact. Since the camera and table is not necessarily aligned, it would show the table at an angle. When this is represented at the wall, it can appear as the tables are placed in a circle around the content. Note that the use of the idea is not limited to this room layout example. Neither is it limited to a large seamless pixel wall, as the principles discussed herein can be applied equally to multi-display systems. As discussed herein, directional audio can enhance the understanding of the scene and/or aid perception.

Turning to FIG. **1**C, FIG. **1**C is a block diagram illustrating additional details associated with system **10**. System **10** includes local conference room **22***a*. Local conference room **22***a* includes display screen **12***a*, participants **20***a*, and **20***b*, and video conferencing unit **28**. In one illustrative example, the representation or location of participants **20***c-e* in image **14** may be adjusted to accommodate presentation material **18**. More specifically, participants **20***e* and **20***f* may be stacked above and/or partially behind participants **20***c* and **20***d*. Blending and/or shading effects may be used on participants **20***c-f* to make them partly visible, while indicating grade of importance and/or distance, all the while keeping the focus of the presentation on presentation material **18**. For example, to show depth and distance, participants **20***e* and **20***f* may be shaded lighter than and partially blended into participants **20***c* and **20***d*. In addition, participants **20***c-f* may be shaded lighter than presentation material **18** to keep the focus on presentation material **18**. If participant **20***c* (or somebody in the group) has a question or is speaking, then participant **20***c* can be shaded darker than the other participants to focus the presentation on participant **20***c*.

Turning to FIG. **2**A, FIG. **2**A is a block diagram illustrating some of the potential arrangements and configurations for system **10**. FIG. **2**A includes local conference room **22***a*, which may include display screen **12***a*, participants **20***a* and **20***b*, cameras **24***a* and **24***b*, video conferencing unit **28**, microphones **32**, and a plurality of speakers **36**. In an embodiment, display screen **12***a* may include cameras **24***a* and **24***b* and one or more speakers **36**. In a particular implementation, cameras **24***a*-**24***b* are positioned somewhat symmetrically in order to efficiently capture image data associated with the video conference. In addition, speakers **36** may be evenly distributed throughout this particular location, site, or room.

In one example, cameras **24***a* and **24***b* and one or more speakers **36** are separate from display screen **12***a*. Cameras **24***a* and **24***b* are configured to capture a video image of participants **20***a* and/or **20***b* in such a way that when reproduced, they appear to be looking into the middle of the meeting towards the presentation material **18**. When all the participants attending the meeting are reproduced in such a manner, it can appear like the participants are in a circle around the middle of presentation material **18**.

Turning to details associated with the infrastructure of system **10**, in one particular example, cameras **24***a* and **24***b* are video cameras configured to capture, record, maintain, cache, receive, and/or transmit image data. This could include transmitting packets over network **34** to a suitable next destination. The captured/recorded image data could be stored in cameras **24***a* and **24***b*, or be provided in some suitable storage area (e.g., a database, a server, video conferencing unit **28**, etc.). In one particular instance, cameras **24***a* and **24***b* can each be a separate network device and have a separate IP address. Each camera **24***a* and **24***b* can include a wireless camera, a high-definition camera, or any other suitable camera device configured to capture image data.

Cameras **24***a* and **24***b* may interact with (or be inclusive of) devices used to initiate a communication for a video session, such as a switch, video conferencing unit **28**, a proprietary endpoint, microphone **32**, a dial pad, a bridge, a telephone, a computer, or any other device, component, element, or object capable of initiating video, voice, audio, media, or data exchanges within system **10**. Cameras **24***a* and **24***b* (and video conferencing unit **28**) may also be configured to include a receiving module, a transmitting module, a processor, a memory, a network interface, a call initiation and acceptance facility such as a dial pad, one or more displays, etc. Any one or more of these items may be consolidated, combined, eliminated entirely, or varied considerably and those modifications may be made based on particular communication needs. Cameras **24***a* and **24***b* can include a high-performance lens and an optical zoom, where cameras **24***a* and **24***b* are capable of performing panning and tilting operations. The video and the audio streams can be sent from cameras **24***a* and **24***b* to video conferencing unit **28**. An application program interface (API) can be used to control the operations of cameras **24***a* and **24***b*.

Video conferencing unit **28** is configured to receive information from cameras **24***a* and **24***b* (e.g., via some connection that may attach to an integrated device). Video conferencing unit **28** may also be configured to control compression activities, or additional processing associated with data received from cameras **24***a* and **24***b*. Alternatively, an actual integrated device can perform this additional processing before image data is sent to its next intended destination. Video conferencing unit **28** can also be configured to store, aggregate, process, export, or otherwise maintain image data and logs in any appropriate format, where these activities can involve a processor and a memory element. Video conferencing unit **28** can include a video element that facilitates data flows between endpoints and a given network. As used herein in this Specification, the term 'video element' is meant to encompass servers, proprietary boxes, network appliances, set-top boxes, or other suitable device, component, element, or object operable to exchange video information with cameras **24***a* and **24***b*.

Video conferencing unit **28** may interface with cameras **24***a* and **24***b* through a wireless connection, or via one or more cables or wires that allow for the propagation of signals between these elements. These devices can also receive signals from an intermediary device, a remote control, microphone **32**, etc. and the signals may leverage infrared, Bluetooth, WiFi, electromagnetic waves generally, or any other suitable transmission protocol for communicating data (e.g., potentially over a network) from one element to another. Virtually any control path can be leveraged in order to deliver information between video conferencing unit **28** and cameras **24***a* and **24***b*. Transmissions between these devices can be bidirectional in certain embodiments such that the devices can interact with each other. This would allow the devices to acknowledge transmissions from each other and offer feedback where appropriate. Any of these devices can be consolidated with each other, or operate independently based on particular configuration needs. In one particular instance, cameras **24***a* and **24***b* are intelligently powered using a USB cable. In a more specific example, video data is transmitted over an HDMI link, and control data is communicated over a USB link.

Turning to FIG. **2**B, FIG. **2**B is a block diagram illustrating some of the potential arrangements and configurations for system **10**. FIG. **2**B includes local conference room **22***a*. Local conference room **22***a* includes display screen **12***a*, participants **20***a*, cameras **24***a* and **24***b*, video conferencing unit **28**, microphone **32**, and a plurality of speakers **36**. Speakers **36** may be may be mounted above display screen, suspended from the ceiling of local conference room **22***a*, or free standing and proximate to display screen and/or the walls of local conference room **22***a*. In an embodiment, cameras **24***a* and **24***b* are proximate to display screen **12***a*. Cameras **24***a* and **24***b* are configured to capture a video image of participants **20***a*. Cameras **24***a* and **24***b* may be may be mounted above display screen, suspended from the ceiling of local conference room **22***a*, or free standing and proximate to display screen **12***a*.

Turning to FIG. **3**A, FIG. **3**A is a block diagram illustrating additional details associated with system **10**, introduced in order to illustrate some of the potential arrangements and configurations for system **10**. FIG. **3**A illustrates a remote conference room (e.g., remote conference room **22***b*) that may be displaying a representation of local conference room **22***a* in FIG. **1**B. FIG. **3**A includes remote conference room **22***b*. Remote conference room **22***b* includes display screen **12***b*, participants **20***c* and **20***d*, and video conferencing unit **28** (located behind display screen **12***b*). Display screen **12***b* includes image **14**. Image **14** includes presentation material **18** and participants **20***a* and **20***b* (from local conference room **22***a*). Because presentation material **18** is a non-mirrored image, participants **20***a-d* can feel like they are in the same room and view and interact with presentation material **18** as if they were in the same room.

Turning to FIG. **3**B, FIG. **3**B is a block diagram illustrating some of the potential arrangements and configurations for system **10**. In one illustrative example, participants **20***a* and **20***b* are from local conference room **22***a* and participants **20***e* and **20***f* are from remote conference room **22***c*. Participants **20***a-f* can feel like they are in the same room when they view and interact with presentation material **18**. Participants **20***a*, **20***b*, **20***e*, and **20***f* can be from multiple conference sites and some may be stacked above and/or partially behind others to preserve display screen **12***b* space for presentation material **18**. This can be done in order to keep the focus on presentation material **18**. Blending and/or shading of participants **20***a*, **20***b*, **20***e*, and **20***f* may be used to indicate grade of importance and/or distance. Such blending and/or shading can help provide a good overview of (and contact with) participants **20***a*, **20***b*, **20***e*, and **20***f*. Audio effects may further help enhance perception and the overview or connection with participants **20***a*, **20***b*, **20***e*, and **20***f*.

Turning to FIG. **4**, FIG. **4** is a block diagram illustrating additional details associated with system **10**. Display module **30** includes a processor **38** and a memory **40**. Display module **30** can be configured to organize screen space to optimize the feeling of presence, while keeping an overview over all meeting participants in a multi-site situation. The meeting participants may be shown in images that can be above and/or partially behind each other, with an optional use of blending, shading, and/or audio effects to make the participants partly visible, while indicating grade of importance and/or distance.

Turning to FIG. **5**, FIG. **5** is a simplified flowchart **500** illustrating one set of potential operation associated with the present disclosure. At **502**, a plurality of images of participants to a meeting are displayed. At **504**, the images of the participants are stacked such that a good overview of all the participants to the meeting is obtained. At **506**, a non-mirror image of presentation material is displayed such that the center of focus is on the presentation material. At **508**, directional audio for the meeting is provided.

As identified previously, a network device (e.g., video conferencing unit **28**) can include software to achieve the video conferencing operations, as outlined herein in this document. In certain example implementations, the video conferencing functions outlined herein may be implemented by logic encoded in one or more tangible, non-transitory media (e.g., embedded logic provided in an application specific integrated circuit [ASIC], digital signal processor [DSP] instructions, software [potentially inclusive of object code and source code] to be executed by a processor [processor **38** shown in FIG. **4**], or other similar machine, etc.). In some of these instances, a memory element [memory **40** shown in FIG. **4**] can store data used for the operations described herein. This includes the memory element being able to store software, logic, code, or processor instructions that are executed to carry out the activities described in this Specification.

The processor can execute any type of instructions associated with the data to achieve the operations detailed herein in this Specification. In one example, the processor can transform an element or an article (e.g., data) from one state or thing to another state or thing. In another example, the activities outlined herein may be implemented with fixed logic or programmable logic (e.g., software/computer instructions executed by the processor) and the elements identified herein

could be some type of a programmable processor, programmable digital logic (e.g., a field programmable gate array [FPGA], an erasable programmable read only memory (EPROM), an electrically erasable programmable ROM (EEPROM)) or an ASIC that includes digital logic, software, code, electronic instructions, or any suitable combination thereof.

Any of these elements (e.g., the network elements, etc.) can include memory elements for storing information to be used in achieving the video conferencing activities as outlined herein. Additionally, each of these devices may include a processor that can execute software or an algorithm to perform the video conferencing activities as discussed in this Specification. These devices may further keep information in any suitable memory element [random access memory (RAM), ROM, EPROM, EEPROM, ASIC, etc.], software, hardware, or in any other suitable component, device, element, or object where appropriate and based on particular needs. Any of the memory items discussed herein should be construed as being encompassed within the broad term 'memory element.' Similarly, any of the potential processing elements, modules, and machines described in this Specification should be construed as being encompassed within the broad term 'processor.' Each of the network elements can also include suitable interfaces for receiving, transmitting, and/or otherwise communicating data or information in a network environment.

Note that with the examples provided above, interaction may be described in terms of two, three, or four network elements. However, this has been done for purposes of clarity and example only. In certain cases, it may be easier to describe one or more of the functionalities of a given set of flows by only referencing a limited number of network elements. It should be appreciated that system **10** (and its teachings) are readily scalable and, further, can accommodate a large number of components, as well as more complicated/sophisticated arrangements and configurations. Accordingly, the examples provided should not limit the scope or inhibit the broad teachings of system **10**, as potentially applied to a myriad of other architectures.

It is also important to note that the steps in the preceding FIGURES illustrate only some of the possible scenarios that may be executed by, or within, system **10**. Some of these steps may be deleted or removed where appropriate, or these steps may be modified or changed considerably without departing from the scope of the present disclosure. In addition, a number of these operations have been described as being executed concurrently with, or in parallel to, one or more additional operations. However, the timing of these operations may be altered considerably. The preceding operational flows have been offered for purposes of example and discussion. Substantial flexibility is provided by system **10** in that any suitable arrangements, chronologies, configurations, and timing mechanisms may be provided without departing from the teachings of the present disclosure.

Although the present disclosure has been described in detail with reference to particular arrangements and configurations, these example configurations and arrangements may be changed significantly without departing from the scope of the present disclosure. For example, the present disclosure has been described with reference to particular communication exchanges and system **10** may be applicable to certain exchanges and protocols in which data are exchanged in order to provide video conferencing operations. In addition, although system **10** has been illustrated with reference to particular elements and operations that facilitate the communication process, these elements and operations may be replaced by any suitable architecture or process that achieves the intended functionality of system **10**.

Numerous other changes, substitutions, variations, alterations, and modifications may be ascertained to one skilled in the art and it is intended that the present disclosure encompass all such changes, substitutions, variations, alterations, and modifications as falling within the scope of the appended claims. In order to assist the United States Patent and Trademark Office (USPTO) and, additionally, any readers of any patent issued on this application in interpreting the claims appended hereto, Applicant wishes to note that the Applicant: (a) does not intend any of the appended claims to invoke paragraph six (6) of 35 U.S.C. section 112 as it exists on the date of the filing hereof unless the words "means for" or "step for" are specifically used in the particular claims; and (b) does not intend, by any statement in the specification, to limit this disclosure in any way that is not otherwise reflected in the appended claims.

What is claimed is:

1. A method, comprising:
receiving video data associated with a meeting in a video-conferencing environment;
displaying a plurality of images of participants such that an overview of the participants is rendered on a display;
moving the plurality of images of the participants rendered on the display such that an image of a presenter or collaboration material is in a center of the display, wherein the collaboration material can be annotated by each of the participants, wherein at least some of the participants are at one or more locations, which are remote from the display; and
providing directional audio for the meeting.

2. The method of claim **1**, further comprising:
stacking the plurality of images to create the overview of the participants of the meeting.

3. The method of claim **1**, wherein a first image of a first one of the participants is partially behind a second image of a second one of the participants.

4. The method of claim **1**, wherein the plurality of images are blended and shaded to indicate an importance thereof, or a distance from the display.

5. The method of claim **1**, further comprising:
displaying a non-mirror image of the collaboration material on the display.

6. The method of claim **1**,
configuring the middle portion of the display in a seamless transition in order to accommodate the presenter or the collaboration material.

7. The method of claim **1**,
wherein the directional audio for the meeting is to assist the participants in perception capabilities associated with the meeting.

8. The method of claim **1**, wherein shared content of the meeting is accommodated during collaboration activities via a touch sensitive wall area.

9. The method of claim **8**, wherein a presence of at least one of the participants in front of the display is detected during the collaboration activities.

10. Logic encoded in non-transitory media that includes instructions for execution and when executed by a processor, is operable to perform operations comprising:
receiving video data associated with a meeting in a video-conferencing environment;
displaying a plurality of images of participants such that an overview of the participants is rendered on a display;
moving the plurality of images of the participants rendered on the display such that an image of a presenter or

collaboration material is in a center of the display, wherein the presenter or the collaboration material are rendered near a middle portion of the display, wherein the collaboration material can be annotated by each of the participants, and wherein at least some of the participants are at one or more locations, which are remote from the display; and

providing directional audio for the meeting.

11. The logic of claim **10**, the operations further comprising:

stacking the plurality of images to create the overview of the participants of the meeting.

12. The logic of claim **10**, wherein a first image of a first one of the participants is partially behind a second image of a second one of the participants.

13. The logic of claim **10**, wherein the plurality of images are blended and shaded to indicate an importance thereof, or a distance from the display.

14. The logic of claim **10**, the operations further comprising:

displaying a non-mirror image of the collaboration material on the display.

15. The logic of claim **10**, the operations further comprising:

configuring the middle portion of the display in a seamless transition in order to accommodate the presenter or the collaboration material.

16. The logic of claim **10**,

wherein the directional audio for the meeting is to assist the participants in perception capabilities associated with the meeting.

17. An apparatus, comprising:

a memory to store data; and

a processor to execute instructions associated with the data, wherein the processor and the memory cooperate such that the apparatus is configured to:

receive video data associated with a meeting in a video-conferencing environment;

display a plurality of images of participants such that an overview of the participants is rendered on a display;

moving the plurality of images of the participants rendered on the display such that an image of a presenter or collaboration material is in a center of the display, wherein the collaboration material can be annotated by each of the participants, and wherein the presenter or the collaboration material are rendered near a middle portion of the display, and wherein at least some of the participants are at one or more locations, which are remote from the display; and

provide directional audio for the meeting.

18. The apparatus of claim **17**, the apparatus being further configured to:

stack the plurality of images to create the overview of the participants of the meeting.

19. The apparatus of claim **17**, wherein a first image of a first one of the participants is partially behind a second image of a second one of the participants.

20. The apparatus of claim **17**, wherein the plurality of images are blended and shaded to indicate an importance thereof, or a distance from the display.

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